

# A call for a new speciality: Forensic odontology as a subject

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## Introduction

Forensic dentistry is a challenging and fascinating branch of forensic science that involves the application of dental sciences in the identification of deceased individuals through the comparison of ante- and post-mortem records. From AD 66 until date, dental identification has proved vital in identifying deceased individuals, the first case being accepted by the law in the year 1849.<sup>[1]</sup> The establishment of forensic odontology as a unique discipline has been attributed to Dr. Oscar Amoeda (Father of Forensic Odontology).<sup>[2]</sup> Recently, forensic odontology has evolved as a new ray of hope in assisting forensic medicine, but this vital and integral field

## Abstract

**Background:** Forensic science is defined as a discipline concerned with the application of science and technology to the detection and investigation of crime and administration of justice, requiring the coordinated efforts of a multidisciplinary team. Dental identification remains one of the most reliable and frequently applied methods of identification. Hence, it can be defined as the science that deals with evidence from the dental and oral structures and is a specialty in itself. **Objectives:** To analyze the level of awareness of Forensic Odontology amongst the individuals from the field of dentistry with the help of a survey. **Materials and Methods:** A questionnaire was prepared and a survey was conducted with a sample size of 200 divided in four groups. **Results:** Revealed inadequate knowledge, poor attitude, and lack of practice of forensic odontology prevailing among the dentists. **Conclusion:** Our study reflects the current situation of our country in the field of forensic odontology, which could be improved by introducing forensic odontology as a subject in the dental curriculum at both the undergraduate and the post-graduate levels.

**Key words:** Attitude, dental practitioners, forensic odontology, knowledge

of forensic medicine is still in a state of infancy in India. There are not many institutions offering formal training in forensic odontology as there is lack of job opportunities for qualified forensic odontologists who have obtained degrees abroad.<sup>[3]</sup>

The important applications of forensic odontology include identification of human remains through dental records and assisting at the scene of crime; in cases of suspected child or adult abuse through bite marks or physical injuries; determination of age and gender of living or deceased and to testify as an expert witness in court to present forensic dental evidence.<sup>[1]</sup>

The big question and in the coming 10 years probably the most burning one will be whether the dental practitioners should know about forensic odontology? The reason being that dental identification provides an accurate source of identification of the victim or the suspect. Natural and man-made disasters occur frequently in India such as Asian Tsunami, Earthquake at Bhuj, Gujarat and lot many goes on. Under these conditions, the bodies of the victims become mutilated beyond recognition. The vital role of

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dental surgeons comes into the picture in the identification of such individuals.<sup>[4]</sup>

Keeping this background in mind the objective of this study was to conduct a survey in I.T.S CDSR Muradnagar, to analyze and assess the knowledge and awareness level of forensic odontology among the individuals from the field of dentistry whether anything needs to be carried out regarding improving the state of affairs of forensic odontology in India.

## Materials and Methods

The present study was conducted at I.T.S for dental studies and research, Muradnagar, Ghaziabad. The surveyed individuals were from different parts of the country. The study sample consisted of 200 individuals divided in four groups

Group 1: Undergraduate students

Group 2: Interns

Group 3: Post-graduate students

Group 4: Practicing clinicians.

A questionnaire was prepared consists of 15 questions all related to the field of forensic odontology. Data were collected in a personalized manner.

## Results and Observations

The results obtained were statistically analyzed by using descriptive analysis.

The comparison of the level of awareness was made within the group as well as across the groups. Every respondent was aware of the forensic odontology as an upcoming speciality. Most of the undergraduate students were only able to state that person's occupation can be adjudged by fossilized teeth. However, all the clinicians responded that all the three statements are true. Regarding the handling of cases related to forensic odontology, there was a mixed response. Even the post-graduates and practicing clinicians were not very confident about handling the cases. Media plays a definitive role in creating awareness among the common man. The same held true for our study as TV serials like crime patrol and CID (crime investigation department) detectives etc., proved to be the source of knowledge for maximum respondents. All the undergraduate students, interns, and post-graduates students felt that their knowledge regarding the subject is inadequate. Forensic related journals/publications are among the least read topics. This can be attributed to lack of speciality journals/publications. None of the respondent was aware of the bite mark pattern of teeth and their application thereof. None of the respondent was aware of the dentist appearing as an expert witness in the court of law. Dental records were maintained by

practitioners and post-graduate students and the most valuable record that was maintained were the radiographs of the patient followed by the casts of the patients. Except for the practicing orthodontist none cared to preserve the record of photographs. Most of the people wanted to inform parents only regarding the child abuse. They claimed that informing all the others such as police and NGO's (non-governmental organization) is inviting problem for them. The awareness regarding the special courses being offered in India and abroad was minimal in the survey population. Most of the interns, post-graduates and practitioners were aware that the dentist have a role to play in mass disasters, but even they were not aware that all the methods can be used for estimation of age of a deceased person. The most common method according to our survey was cementum annulations followed by deposition of secondary dentin.

## Discussion

Forensic science is primarily concerned with the application of science in court or legal proceedings. Forensic odontology is an important branch of the study of dentistry that would assist in solving cases of abuses and deaths. Greater knowledge and awareness of forensic odontology among the dental practitioners would be required in the growing field of medicine.<sup>[4]</sup>

The practice of forensic odontology has gained importance in a number of developed countries across the world. However, in developing countries like India, utilization of forensic odontology in the criminal justice system is minimal. It is yet to gain full momentum. The death toll in India due to the tsunami in 2004 was more than 15,000, but it is a question left unanswered, whether all victims were identified. This could have been made possible if there were adequate forensic odontologists for identification of the victims. It is vital that people who are interested in forensic odontology must be properly educated and trained.<sup>[5]</sup>

This study was conducted among the individuals from the field of dentistry to assess their awareness about forensic odontology. The results show that the knowledge of forensic odontology among the dental practitioners is not adequate.

The significance of forensic odontology can be attributed to the ability of the dental tissues to withstand environmental assaults and still retain some of its original structure. This makes teeth an excellent and an accurate source for deoxyribonucleic acid material. Even the few practitioners, who were aware of this, answered more by their knowledge that was gained through the media.<sup>[6]</sup> Forensic dentists who are associated with identification of the deceased and crime investigations are usually required to provide testimony in the court of law in the capacity of an "expert witness." Nearly one-third of the respondents were not aware that

**Table 1: Questionnaire for survey**

1. Forensic dentistry involves the study of teeth with the intention of providing facts to be used as evidence in the court of law. What is another name for this field of study?
  - Forensic odontology
  - Forensic anthropology
  - Forensic palynology
  - Forensic entomology
2. When skeletons are found teeth are an important source of information. In such cases, which of the following statements is the most accurate?
  - Teeth can indicate a person's occupation
  - Teeth can indicate a person's age
  - Teeth can indicate a person's ethnic background
  - All three statements are true
3. How confident are you if some asks your opinion although handling forensic dentistry related cases?
  - Very confident
  - Confident
  - Less confident
4. What is the source of information about your knowledge in forensic odontology?
  - Lectures
  - TV serials such as crime patrol, CID,
  - Newspapers
  - Others
5. Do you think your knowledge level/awareness about forensic dentistry is adequate?
  - Adequate
  - Inadequate
  - Average
6. Do you read forensic dentistry related journals/publication?
  - Yes
  - No
  - Occasionally
7. Are you aware of the bite mark patterns of teeth and its application thereof?
  - Yes
  - No
8. Are you aware that you can testify as an expert witness in court to present forensic dental evidence?
  - Yes
  - No
9. Do you maintain dental records?
  - Yes
  - No
10. If yes, which of the following are maintained?
  - Casts
  - Radiograph
  - Photograph of patients
11. What would you do if you identify signs and symptoms of child abuse?
  - Inform police
  - Inform NGO's
  - Inform parents
  - Take no actions
12. Do u know if there are any formal training courses for forensic odontology in India?
  - Yes
  - No
13. Do you know any centers around the world where formal training for forensic odontology courses are given? If yes name them
  - Yes
  - No

*Contd...*

**Table 1: Contd...**

14. As a dentist do you know any role of forensic odontology in mass disaster?
  - Yes
  - No
15. Which method is reliable to identify the age of deceased in the event of a mass disaster?
  - Enamel translucency
  - Cementum annulations
  - Deposition of secondary dentin
  - All of the above

CID = Criminal investigation department, NGO = Non-governmental organization

they could testify as an expert witness in court to present forensic evidence although, a few were not willing to testify even if called upon.<sup>[7]</sup>

Age is one of the essential factors in establishing the identity of a person. Estimation of the human age is a procedure adopted by anthropologists, archaeologists, and forensic scientists. This has helped forensic odontologists to solve cases in countries abroad, and could similarly play a very significant role in solving cases in India. However, nearly half of the practitioners did not know how to estimate the dental age by examining the teeth. The reasons for this could be multifactorial, either their ignorance/lack of basic knowledge or lack of confidence in answering this question, apart from not knowing the significance of dental age with regard to forensics.<sup>[8]</sup>

The dental record serves a purpose of future reference for the practitioners when needed and is not always maintained for a forensic purpose. The majority of the dental practitioners were aware of the significance of maintaining dental records. Strikingly, only very few practitioners maintain complete records.<sup>[4]</sup>

The identification of a large number of casualties in mass disasters is complex and fraught with hazards, both physically and emotionally. A forensic anthropologist may be called in when human remains are found during archaeological excavation, or when badly decomposed, burned, or skeletonised remains are found by law enforcement or members of the public. Most of the dental practitioners in the study were not aware of the methods to identify the age and gender of the deceased individuals, which is where the most vital role of forensic odontologists comes into play.<sup>[9,10]</sup>

Formal training institutes in forensic odontology are the media through which people can raise their knowledge and awareness level toward speciality forensic dentistry, ironically maximum of the dental practitioners lack their awareness toward these institutes. Another reason could be there are very few institutions offering formal training in the forensic odontology. Most of the practitioners had no formal training. There are no fully equipped labs for forensic odontology in India. Forensic odontology was

not included as a part of our academic curriculum until recently. There are very few workshops or conferences that have been conducted in forensic odontology per year for dental surgeons, which could kindle an interest among the students to probe deeper into the subject.<sup>[9]</sup>

Journals or publications always remain one of the very important sources of information in every field, according to this study very few dental practitioners read forensic related journals or publications. An effort should be made to cover the cases related too forensic odontology through mass media.

## Conclusion

This study reveals that there is inadequate knowledge, poor attitude, and lack of awareness toward the branch of forensic dentistry. This study reflects the current situation of our country in the field of forensic odontology.

This condition; however, could be improved if necessary steps are taken to make forensic odontology a part of our undergraduate curriculum and the introduction of post-graduation in forensic odontology. In addition, conducting periodic conferences, seminars, and publications of a major breakthrough cases would help the dental practitioners and students enrich their knowledge about forensic odontology. We as dentists and experts in the field of dentistry are only not fully aware of the forensic odontology and its application. The awareness has to be

created among the dentists first and then the same can be reached out to the society.

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